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CONCEPT DEFINITION FOR THE PROBLEMS DATA BASE COMPONENT OF THE --ETC(U)
JUN 79 E D SMITH, R D WEBSTER

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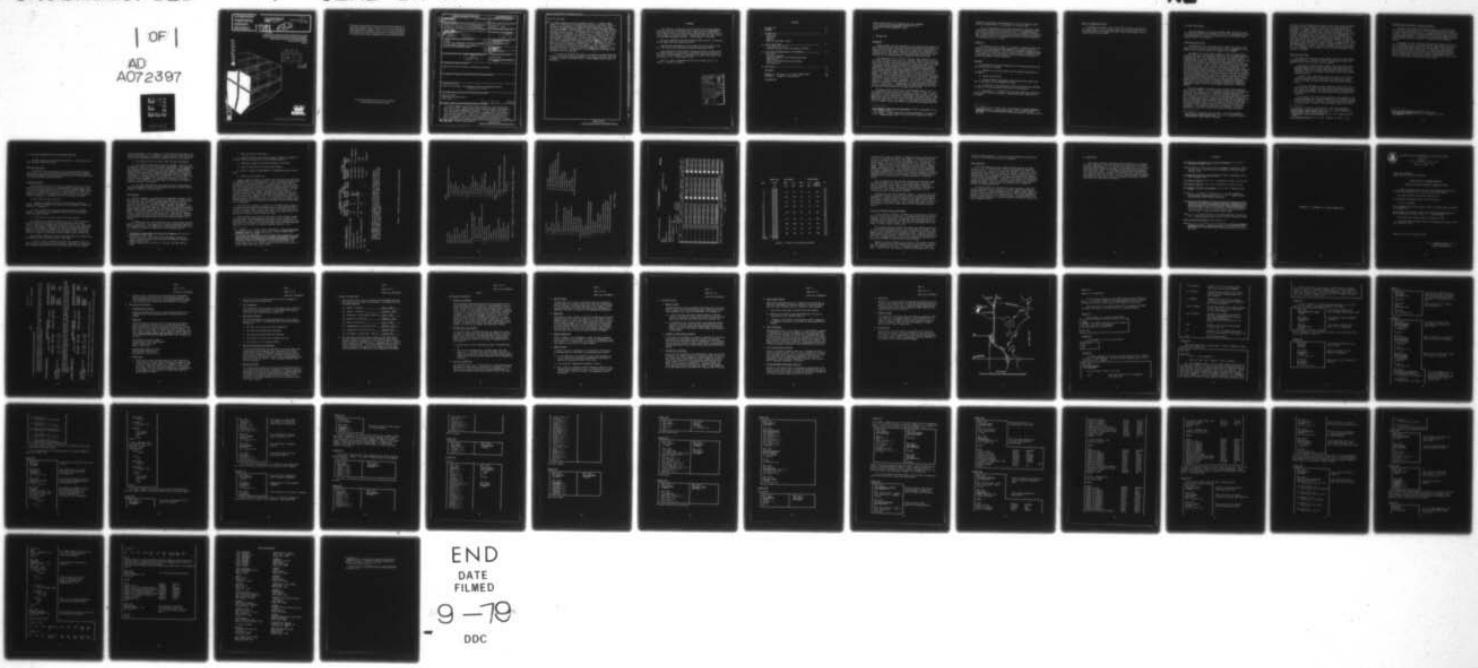

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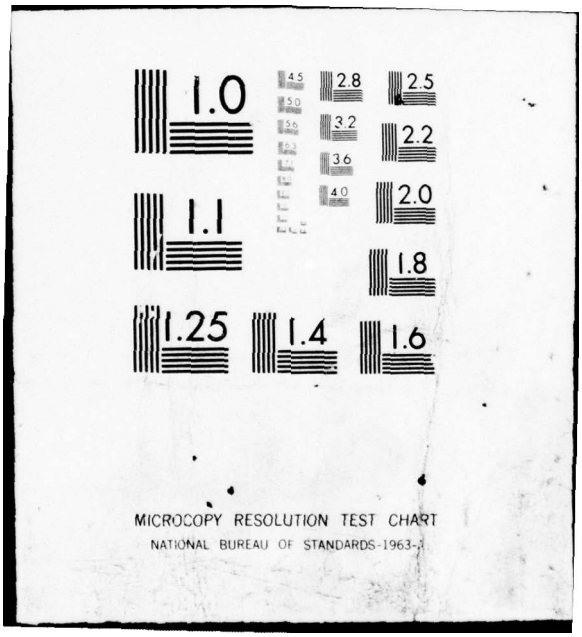
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INTERIM REPORT N-73
June 1979

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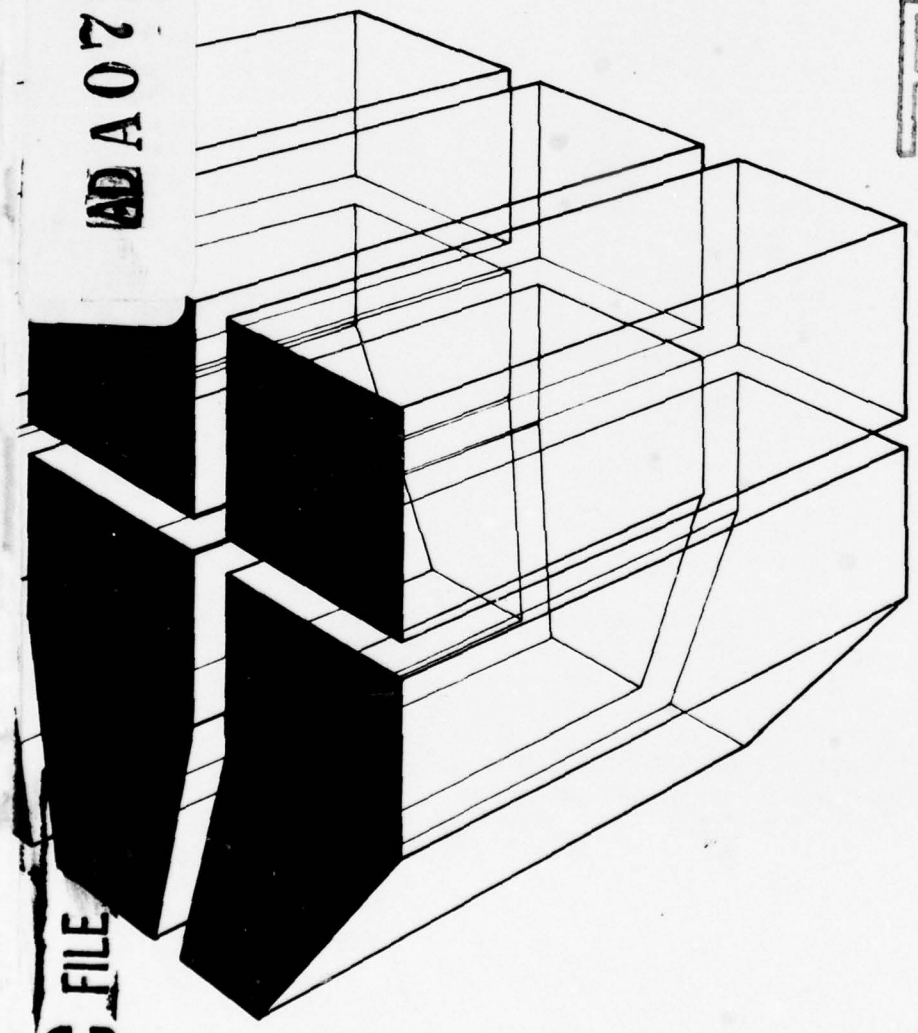
CONCEPT DEFINITION FOR THE PROBLEMS DATA BASE COMPONENT OF THE WATER POLLUTION ABATEMENT SUBSYSTEM OF THE POLLUTION ABATEMENT MANAGEMENT SYSTEM (PAMS)



by
E.D. Smith
R.D. Webster

CERL

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Recent Federal legislation on water pollution, such as the Clean Water Act of 1977, requires Army installations to control the quality of their point-source wastewater effluents. In fact, some of the legislation stipulates mandatory penalties for noncompliance, and the EPA is enforcing such penalties. These facts, coupled with the high priority that the Department of the Army (DA) has placed on improved environmental management techniques, clearly demonstrate the need for a system

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to manage wastewater pollution-abatement efforts. To address these needs, U.S. Army Construction Engineering Research Laboratory (CERL) researchers are developing a Problems Data Base component of the Water Pollution Abatement Subsystem (WPAS) of the Pollution Abatement Management System (PAMS). This Problems Data Base will help the Army Facility Engineers, Major Commands, and Headquarter's Environmental Offices meet environmental requirements by supplying manual, interactive-mode, computer-assisted procedures that provide a permanent inventory of (1) all DA wastewater treatment-plant (or other point-source) self-monitoring data and (2) associated NPDES permit information. Once readily available, this information will allow systems users to compare the self-monitoring data to appropriate NPDES permits to see whether an installation complies with legislative requirements. If not, responsible personnel could then correct the problem by planning, budgeting, or upgrading facilities. The system will also allow priority ranking of DA wastewater pollution problems.

If a pollution Problems Data Base is available to perform these two tasks, it will be possible to aggregate the record of DA water pollution at TRADOC, FORSCOM, and DARCOM levels to Major Command and DA levels if necessary.

FOREWORD

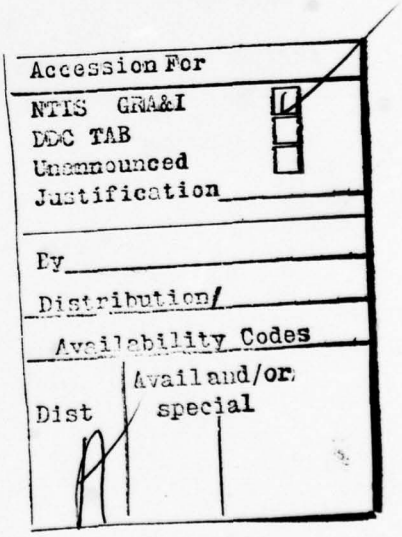
This study was sponsored by the Directorate of Military Programs, Office of the Chief of Engineers (OCE), under Project 4A762720A896, "Environmental Quality for Construction and Operation of Military Facilities"; Task T2, "Pollution Control Technology"; Work Unit 008, "Pollution Abatement Management System." The QCR number is 3.01.004.

Mr. W. S. Medding was the OCE Technical Monitor and Dr. D. Dery was the HQ TRADOC Associate Technical Monitor.

The work was performed by the Environmental Division (EN) of the U.S. Army Construction Engineering Research Laboratory (CERL).

This research was made possible through the efforts of OCE personnel, MACOM advisors, and scientific consultants from the University of Illinois at Urbana-Champaign. Administrative support and counsel were provided by Dr. R. K. Jain, Chief of EN.

COL J. E. Hays is Commander and Director of CERL, and D. L. R. Shaffer is Technical Director.



CONTENTS

CONCEPT DEFINITION FOR THE PROBLEMS DATA BASE COMPONENT
OF THE WATER POLLUTION ABATEMENT SUBSYSTEM OF THE
POLLUTION ABATEMENT MANAGEMENT SYSTEM
(PAMS)

1 INTRODUCTION

Background

Recent Federal and state legislation and regulatory requirements on water pollution require that Army installations contain the effluent of their operations within prescribed limits of quality. Major goals of AR-200-1[1] are for the Army to conserve and protect water resources from contamination by identifying, treating, monitoring, controlling, and disposing of all waterborne wastes produced by Army facilities.

The Clean Water Act of 1977 (P.L. 95-217), which amended the Federal Water Pollution Control Act (P.L. 92-500), prohibits any individual (including the Army) from discharging pollutants into a receiving stream from a point source, unless the discharge is authorized by the U.S. Environmental Protection Agency (EPA) or an EPA-approved state agency. Authorization is in the form of a National Pollutant Discharge Elimination System (NPDES) Permit when granted by EPA, or a State Pollutant Discharge Elimination System (SPDES) Permit if received from a state agency. The NPDES (or SPDES) permit controls the type and amount of effluent that can be released from each specified point source. Discharge requirements are not constant during the life of a permit but grow more rigid as its expiration date approaches. The effluent limitations are reduced in a stepwise manner according to the goals of the Federal Water Pollution Control Act.[2] To determine if an Army wastewater treatment plant is in compliance, a monthly NPDES self-monitoring report(s) must be submitted by each Army facility under permit to EPA.

The Army has been issued several hundred NPDES permits, and it is anticipated that many more will be issued. Clearly, in order to comply with Federal, state, and AR 200-1 requirements, Army planners, Facility Engineers, and other Army decision makers must have quick access to Army NPDES permit data and must be able to analyze routinely collected self-monitoring report data. This analysis of the water pollution abatement data will enable the decision makers to identify Army noncompliance with

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[1] Environmental Protection and Enhancement, AR 200-1 (Department of the Army, December 1975).

[2] J. M. Seeger, "A Simple Approach to Improved Wastewater Treatment Reports," Deeds and Data (Water Pollution Control Federation, 1978).

regulatory requirements and consequently prioritize ranking of water pollution problems within the Department of the Army (DA).

The U.S. Army Construction Engineering Research Laboratory (CERL) is developing the detailed concept definition of a system which will provide the necessary data and analysis tools to enable DA planners to make informed, effective decisions regarding water pollution strategies. CERL Technical Report N-42 documented the general concept formulation for development of such a system.

Objective

The objective of this report is to present a detailed concept definition for the Problems Data Base Component of the Water Pollution Abatement Subsystem (WPAS) of the Pollution Abatement Management System (PAMS)[3] and to (1) describe the relationship of this Problems Data Base to the NPDES monitoring requirements, and (2) describe the status of system development and work remaining.

Approach

In developing the detailed concept for the Problems Data Base, the approach used was as follows:

a. Analysis of pertinent current and anticipated regulatory requirements;

b. Review of data bases;

c. Review of NPDES requirements and self-monitoring reports and their relationship to the Problems Data Base;

d. Formulation of requirements for putting the pollution abatement information into the system and analyzing this information;

e. Development of a framework for using the system for identifying water pollution control problems or noncompliance with regulatory requirements.

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[3] R. D. Webster, E. D. Smith, and V. Kothandaraman, Pollution Abatement Management System -- Concept Definition, Technical Report N-42/ ADA055565 (U.S. Army Construction Engineering Research Laboratory [CERL], May 1978).

Mode of Technology Transfer

Information developed in this report will be used to document AR 18-1 requirements. This information will specifically form a basis for the General Functional System Requirements and for development of the Project Master Plan for PAMS.

2 RECENT REGULATIONS

Much has happened in the area of Federal water legislation since the conceptual definition of PAMS was written. The legal modifications discussed below have required rethinking of many of the subtle operational details of the system.

Clean Water Act of 1977

On December 28, 1977, President Carter signed into law the Clean Water Act (P.L. 95-217), which consists of a set of amendments to the Federal Water Pollution Control Act (FWPCA) (P.L. 92-500).[4]

The FWPCA, last significantly amended in 1972, had established a national goal that the discharge of pollutants into navigable waters be eliminated by 1985. An intermediate goal, the so-called "fishable/swimmable goal," was that "wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983." Closely related to these goals were the following requirements for industrial point-source discharge. Existing sources had to comply by July 1, 1977 with effluent limits based on Best Practicable Control Technology Currently Available (BPT), or with the more stringent effluent limitations based on water-quality standards reflecting secondary contact use such as fishing. By July 1, 1983, existing sources must meet effluent limits based on Best Available Technology Economically Achievable (BAT), or more stringent water-quality-based effluent limits reflecting fishable, swimmable uses whenever attainable. New sources had to immediately comply with standards of performance based on Best Available Demonstrated Control Technology (BADCT).

The 1972 amendments provided for two variances from technology-based effluent limits: (1) for dischargers of heat who can assure "the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of the water into which the discharge is to be made," and (2) for any discharger bound by the more stringent water-quality standard based on BAT who can show that the modified requirement would "represent the maximum use of technology within the economic capability of the owner or operator" and "result in reasonable further progress toward the elimination of discharge of pollutants." The industrial point-source requirements in the 1972 amendments are enforced through the National Pollutant Discharge

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[4] W. Goldfarb, "Litigation and Legislation - The 1977 Amendments," American Water Resources Bulletin, Vol 4, No. 2 (American Water Resources Assoc., April 1978), pp 491-493.

Elimination System (NPDES) permit system, which incorporates the FWPCA's principle that any discharge in violation of the above-mentioned requirements is illegal.[5] Among the nearly 80 provisions of the Clean Water Act, it modifies several major aspects of the FWPCA.[6] The law postpones the 1983 deadline for best available technology (BAT) to July 1, 1984, and requires that the EPA apply a test of "reasonableness" before it strengthens effluent standards for an industry that has already met the 1977 best practicable technology standard. The law further identifies three categories of pollutants: (1) conventional (e.g., biochemical oxygen demand, total organic solids, suspended solids), (2) nonconventional (e.g., metals, organic, nitrogen) and (3) toxic. There are 139 substances listed in the toxic pollutants category, and these and other compounds that are added to the list later are subject to BAT control, at minimum.

State and Local Laws

In October 1978, President Carter ordered (Executive Order 12088) Government agencies to insure that Federal facilities and operations comply with all state and local control standards.

> According to a White House statement, the new Executive Order 12088 re-emphasizes that federal agencies obey "most pollution abatement regulations" and adds that they also comply with state, interstate, and local procedural regulations, "just as any private industry must do."
>
> Executive Order 12088 (43 FR 47707) will apply to all federal property and operations, including military bases, open lands, office buildings, and other structures such as research laboratories.
>
> In signing the executive order, President Carter said, "This administration is committed to the goals of achieving and maintaining a clean environment. The Federal Government itself should be the leader in that effort, and this order will help establish that leadership."
>
> Carter added, "For the fiscal year which is now beginning, the Federal Government will spend over $484 million to correct problems at facilities that are currently in violation of pollution laws and to prevent future violations from occurring at other facilities."[7]

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5 W. Goldfarb, "Litigation and Legislation - the 1977 Amendments," American Water Resources Bulletin, Vol 4, No. 2 (American Water Resources Assoc., April 1978), pp 491-493.

6 Environmental Science and Technology, Vol 12, No. 2 (February 1978), p 129.

7 Environmental Reporter, Vol 9, No. 25. (October 20, 1978), p 1167.

Possible Judicial Action for Federal Violators

The EPA has notified several Federal agencies, including the DA, that they must take immediate action to end water pollution at their facilities around the United States. The deputy administrator of EPA sent a letter to the agencies in violation telling them that they must meet the same water standards as municipalities and private industry and that prompt resolution of the violations is required to avoid judicial action.[8]

On November 25, 1977, the EPA's Chicago office became the first of EPA's 10 regions to enforce the FWPCA against major Federal facilities. It issued 19 enforcement letters to polluting Federal installations, four of which were Army installations. To appreciate the potential extent of water pollution violations, one should contemplate the fact that the deputy administrator also listed 77 "major water-pollution sources currently not complying with Federal environmental laws," but he did not issue notices of violation to any of them.[9]

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8 Water and Wastes Engineering (March 1978), p 8.
9 Environmental Reporter, Vol 8, No. 32 (December 9, 1977), pp 1174-1175.

3 DESIGN AND IMPLEMENTATION OF THE PROBLEMS DATA BASE

The WPAS comprises two component subroutines -- the Solutions Data Base and the Problems Data Base.

Solutions Data Base

The Solutions Data Base inputs will provide Army decision makers with a rapid, up-to-date information system for evaluating alternative wastewater treatment processes and determining which is most appropriate for any Army-related pollution problem.

Problems Data Base

The Problems Data Base will provide a permanent record of all data submitted by plant operators for Army wastewater treatment facilities. It will also enable comparison of this data to appropriate NPDES permits in order to (1) determine the status of compliance, and (2) inform responsible personnel of any exceptions so that corrective action such as planning, budgeting, or upgrading of facilities may be initiated.

In particular this data base will:

1. Provide an inventory of water pollution point sources at TRADOC, FORSCOM, and DARCOM levels which can be aggregated to MACOM and DA blocks if necessary.

2. Aid in the periodic monitoring and reporting of scheduled progress in water-pollution abatement efforts prescribed by Federal, state, and Army standards.

3. Allow priority ranking of water pollution problems.

To manage the environmental impact of its facilities, the DA must be able to monitor the status (design [completion], construction [start], construction [completion], operation [start], final compliance, etc.) of the hundreds of NPDES permits issued for Army point-source discharges. Army elements, commands, and facility engineers who perform water-pollution studies would particularly benefit from a centralized interactive computer system which provides NPDES-related information.

Since concept formulation several steps have been taken towards the development of the Problems Data Base of the WPAS:

1. Several facility engineers have been interviewed in order to ascertain their requirements and the potential usefulness of the system. Their comments have been evaluated and incorporated into the planned

system development. This strategy is in line with the philosophy of research and development that suggests incorporating user input during the research and technology transfer base phases as well as later phases.[10]

2. The system has been tailored to meet the Army requirements.

3. The system has been made interactive, dynamic, versatile, and expandable in order to fulfill contingent requirements. The combination of intensified efforts to improve the DA's water-pollution management, and accumulation of information on increased numbers of NPDES permits demands highly sophisticated techniques for managing pollution-control information. Since the early 1960's, high-speed electronic computers have been able to handle masses of information.[11] It is felt that a DA water-pollution management data system using computers will be desirable, if not essential, in guiding many of the Army's environmental decisions now and in the future.

4. Individual components of the system have been interrelated so that these components can be used separately to meet a specific need or together to achieve an overall result.

NPDES Permits

The basic document in a water-pollution abatement strategy is the NPDES permit. Under the NPDES program, the USEPA (or in certain states, the state EPA) must authorize every wastewater discharge into the nation's water courses. The NPDES permits for Army installations -- under the separate jurisdictions of TRADOC, FORSCOM, and DARCOM -- will form the core of the WPAS subsystem. According to an Army Environmental Hygiene Agency (AEHA) spokesman, EPA has issued 352 NPDES permits to the Army.[12] Of these 352 permits, 248 are in final form and the rest are either in draft form or have been applied for. These permits regulate 131 Army sewage treatment plants and 43 Army industrial waste treatment plants (many of the permits control more than one point-source discharge).

The NPDES permit for each installation has a unique number and this number, in addition to the location of the waste discharges, identifies each discharge point. Each NPDES permit stipulates the following criteria (Appendix A presents an example of a typical NPDES permit):

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10 Army Research, Development, and Acquisition Magazine, Vol 19, No. 2 (March-April 1978), p 24.

11 "Demonstration of a State Water Quality Management Information System," EPA 600/5-74-022 (United States Environmental Protection Agency [USEPA], 1974).

12 Personal communication with Steve L. Kistner, USA AEHA (May 30, 1978).

1. Expiration date of the permit

2. Specific effluent limitations (Figure 1 presents an example of effluent limitations specified in a typical NPDES permit.)

3. Compliance schedules for meeting effluent limitations

4. Specific sampling and monitoring requirements

5. Specific reporting requirements for documenting permit compliances

6. Special permit conditions.

Figure 2 shows the topical listing of the provisions and conditions of an NPDES permit for USEPA Region IV. Since a preliminary examination of the permits issued by different EPA regions has revealed that requirements are not uniform from one region to another, it will be necessary to store detailed information on monitoring and reporting requirements and responsibilities for each of the 10 USEPA regions. For each of the DA installations, however, information on permit number, location, effective date, permit expiration date, details of effluent qualities to be met, schedule of compliance and schedule of reporting will be stored in the computer file. This file will allow access to information on any installation as well as to the details of special conditions and provisions of the permit and effluent limitations and schedule of compliance.

One of the most important provisions of the NPDES permit system is the monitoring and reporting of effluent quality using EPA Form 3320-1 (10-72).[13] Figure 3 shows a blank 3320-1 form. Self-monitoring data obtained by all Army permittees under the terms of the permit must be reported periodically to the EPA using this form.

Figure 4 shows typical data[14] taken from an Army secondary sewage treatment plant to be entered either directly or as an average to the EPA Form 3320-1. When the Problems Data Base is fully operational, this same data will be entered into the centralized Water-Pollution Abatement Subsystem at an interactive, portable computer terminal. This

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[13] R. D. Webster, E. D. Smith, and V. Kothandaraman, Pollution Abatement Management System -- Concept Definition, Technical Report N-42/ ADA055565 (CERL, May 1978).

[14] A Prototype for Development of Routine Operational Procedures for the Reporting of Self-Monitoring Data as Applied in Wastewater Treatment Facilities and in the Monitoring of Effluent Waste-waters, EPA B-274.876 W.P. EMP 2, 3.77 (National Training and Operational Technology Center, Municipal Operations and Training Division, Office of Water Program Operations, USEPA, 1966).

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS Concentration in mg/ℓ Monthly Average	Weekly Average	kg/day (lbs/day) Monthly Average	Weekly Average	MINIMUM MONITORING REQUIREMENTS Measurement Frequency	Sample Type
Biochemical Oxygen Demand (5-day)	*30	45	70 (150)		twice weekly	24 hr. composite
Suspended Solids	*30	45	80 (180)		twice weekly	24 hr. composite
pH - standard units	6.0-9.0 (not to be averaged)				twice weekly	grab
Fecal Coliform - organisms/100 mℓ	200	400	---	---	twice weekly	grab
Flow - mgd	---	---	---	---	daily	recording

* The arithmetic mean of the values for effluent samples measuring biochemical oxygen demand (5-day) and suspended solids collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal--minimum).

Figure 1. Effluent limitations and monitoring requirements.

Name of Permittee:

Application Number:

Permit Number:

Effective Date of Permit:

Expiration Date of Permit:

Permit Issued By:

Location of Discharge:

Name of Receiving Water:

Classification of Receiving Water

Part I

A. Effluent Limitations and Monitoring Requirements
   1. Period of Authorization for Discharge
   2. Effluent Limitations
   3. Sampling Point, Type, and Frequency
   4. Effluent-Influent Qualities Relationship to be Satisfied

B. Schedule of Compliance

C. Monitoring and Reporting
   1. Representative Sampling
   2. Reporting
   3. Test Procedures
   4. Recording Results
   5. Additional Monitoring by Permittee
   6. Records Retention
   7. Location of Sampling Points
   8. Flow Determination
   9. Substitution for BOD Tests

Part II

A. Management Requirements (when the following occur)
   1. Change in Discharge
   2. Non-Compliance
   3. Facilities Operation
   4. Adverse Impact
   5. Bypassing
   6. Removed Substances
   7. Power Failure

B. Responsibilities
   1. Right of Entry
   2. Transfer of Ownership or Control
   3. Availability of Reports
   4. Permit Notification
   5. Toxic Pollutants
   6. Civil and Criminal Liability
   7. Oil and Hazardous Substance Liability
   8. State Laws
   9. Property Rights
   10. Severability

Part III -- Other Requirements

A. Definitions
   1. Discharge Limitations and Monitoring Requirements
      a. Flow
      b. Concentration and Any Value Other Than Fecal Coliform Bacteria, Flow, or Loading

Figure 2. An example of a topical listing from an NPDES permit for Region IV.

c. Fecal Coliform

d. Loading

e. Other Definitions

2. Discharge Sources

a. Potable and Industrial Water Treatment Facilities

b. Cooling Systems

c. Boilers

d. Vehicle and Equipment Cleaning Facilities

e. Painting and Corrosion Control Facilities

f. Petroleum Storage and Handling Areas

g. Vehicle and Equipment Maintenance Facilities

h. Battery Rework Facilities

i. Photographic Laboratories

j. Fire Fighter Training Areas

B. Additional Permitted Discharges

1. Applicability

2. General Conditions

3. Interim Discharge Limitations and Monitoring Requirements

4. Final Discharge Limitations and Monitoring Requirements

a. General Requirements

b. Special Conditions

(1) Discharge less than 2000 gpd

(2) Discharges to storm sewers

c. Discharge Limitations and Monitoring Requirements

(1) Potable and Industrial Water Treatment Facilities including filters, softeners, and demineralizers.

(2) Cooling Water, Cooling Tower Blowdown, and Cleaning Wastes

(3) Boiler Blowdown

(4) Vehicle Equipment Cleaning Facilities

(5) Painting and Corrosion Control Facilities

(6) Vehicle and Equipment Maintenance and Storage

(7) Petroleum, Oil, and Lubricant (POL) Storage Handling Areas

(8) Battery Maintenance

(9) Photographic Laboratories

(10) Fire Fighter Training Areas

(11) Swimming Pools

(12) Storm Sewers

5. Schedule of Compliance

Requirements for adjudicatory hearing request

Figure 2 (cont'd).

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
DISCHARGE MONITORING REPORT

Form Approved
OMB NO. 158-R0073

Facility or discharge location

Name
Street
City
State/Zip code

see INSTRUCTIONS on back

Remarks

Telephone number (including area code)

(2-3) ST | (4-16) PERMIT NUMBER | (17-19) DIS

REPORTING PERIOD: FROM (20-21) YEAR (22-23) MO (24-25) DAY TO (26-27) YEAR (28-29) MO (30-31) DAY

PARAMETER (32-37)		QUANTITY (3 card only) MINIMUM (38-45)	AVERAGE (46-53)	MAXIMUM (54-61)	UNITS	NO. EX (62-63)	CONCENTRATION (4 card only) MINIMUM (38-45)	AVERAGE (46-53)	MAXIMUM (54-61)	UNITS	NO. EX (62-63)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
	REPORTED												
	PERMIT CONDITION												
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NAME OF PRINCIPAL EXECUTIVE OFFICER	TITLE OF THE OFFICER	DATE	I certify that I am familiar with the information contained in this report and that to the best of my knowledge and belief such information is true, complete, and accurate.	
LAST FIRST MI	TITLE	YEAR MO DAY		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

Figure 3. Form 3320-1.

	SEWAGE FLOW	RAW INFLUENT		FINAL EFFLUENT			
Date	Treated	BOD_5	T.S.S.	BOD_5	T.S.S.	Fecal Coliform	pH
	gpd	mg/ℓ	mg/ℓ	mg/ℓ	mg/ℓ	N/100 mℓ	
1	720,000						7.4
2	609,000						7.5
3	326,900	170	171	16	12	350	7.6
4	367,500						7.4
5	323,900						7.5
6	458,500	160	168	15	16	540	7.7
7	571,000						5.4
8	508,600						7.6
9	146,000	200	200	20	25	180	7.9
10	253,000						7.2
11	406,800						7.1
12	519,200	190	198	20	25	170	7.6
13	328,600						7.5
14	413,100						7.6
15	699,000						8.0
16	708,900	150	180	35	60	220	8.0
17	806,700						9.2
18	714,800						8.0
19	169,100						9.1
20	272,900	170	170	19	19	240	7.5
21	713,200						7.8
22	671,900						7.0
23	761,800	150	186	20	23	110	7.4
24	642,900						7.5
25	314,900						7.4
26	291,600	190	195	20	20	130	7.5
27	240,700						7.4
28	478,900						7.4
29	525,600	190	195	25	25	280	7.6
30	670,100						7.8
Total	14,635,200						
Average	487,800						

Figure 4. Example of self-monitoring data.

information will make it possible to compare the waste discharge characteristics to the effluent quality requirements. If there are any violations of the NPDES limitations, the computer will list the source, permit number, and items in violation and store this information. This stored information could then be aggregated to give location, permit number, items in violation and so forth for each EPA region at TRADOC, DARCOM, and FORSCOM levels. The information would also be aggregated according to water-quality parameters which are in violation for each EPA region at MACOM level in order to (1) identify problems in pollution abatement efforts and rank the environmental pollution problems within the DA, and (2) initiate action to achieve compliance in individual cases.

With information on the compliance and pollution-abatement schedules and the comparative status of each installation at any time, it would be possible to keep track of the DA performance in meeting pollution-abatement goals. Appropriate action could be taken when an installation is not complying and reporting requirements can be monitored and kept on track using the WPAS.

Information on pollution-abatement projects -- covering each stage of conception, funding, design, and initiation of construction through completion -- would be stored in computer files, and OCE could monitor the progress of these projects with the aid of reports such as 1391's and reports on EPA/State visits. Such a scheme would make it easier to track projects and provide added information for the decision-making process.

Status of the NPDES Monitoring Package

A pilot software package of the NPDES monitoring system of WPAS has been on-line for several months and is currently being scrutinized and debugged. Routine checking of the package with "real world" data has revealed detailed operational problems, but these problems have not altered the overall system concept. The system is being modified as necessary in order to make it more usable.

This software package provides for interactive terminal operations. It is currently envisioned that the real-time system will enable a user to enter into a dialogue with the system in order to obtain the desired NPDES-related information more expeditiously than is possible with any batch mode or manual system. The system is to be as self-explanatory as practical, although when the system is fully operational the users will have a User's Manual to acquaint them with the system.

Appendix B provides examples of a portion of the system's capability. Once acquainted with the commands, the user can perform countless types of information retrievals. The appendix shows only a few examples. A user's manual and perhaps a short training course will allow

users to become competent in a short time even though they may have had limited or no previous experience with computers.

Work Remaining

After the Problems Data Base system has been modified and implemented, it will be field-tested, verified, and checked for usefulness and practicality. There will be two User's Manuals: the first, a program manager's overview of the system; the second, a compilation of the elements required for applying the system. The overview will discuss the objectives and development of the system and describe the operations of the various system modules. Included in this manual will be required inputs and outputs, and uses to which the system may be put as well as manpower estimates, operating cost requirements, and a summary of methods for system application.

The second manual will document the inputs required to apply the system, including detailed coding instructions, sample output reports, and documentation. System documentation will comprise system inputs and outputs, system flow charts and books, control and clerical procedures, operator's instructions, and all program books. The second manual will provide enough information to enable interested individuals to apply the WPAS subsystem of PAMS.

4 CONCLUSIONS

This report presents a detailed concept formulation of a Problems Data Base component of PAMS and provides (1) an analysis of pertinent regulatory requirements, (2) a review of data bases, and (3) a review of the relationship of NPDES requirements and self-monitoring reports to the Problems Data Base. It also shows how water pollution abatement data which are routinely collected at installations can form the basis for a problems data base in PAMS. Finally, the report details framework development for user identification of wastewater problems or DA non-compliance with regulatory requirements.

REFERENCES

Army Research, Development, and Acquisition Magazine, Vol 19, No. 2 (March-April 1978), p 24.

"Demonstration of a State Water Quality Management Information System," EPA 600/5-74-022 (United States Environmental Protection Agency [USEPA], 1974).

Environmental Protection and Enhancement, AR 200-1 (Department of the Army, December 1975).

Environmental Reporter, Vol 8, No. 32 (December 9, 1977), pp 1174-1175.

Environmental Reporter, Vol 9, No. 25 (October 20, 1978), p 1167.

Environmental Science and Technology, Vol 12, No. 2 (February 1978), P 129.

Goldfarb, W., "Litigation and Legislation -- The 1977 Amendments," American Water Resources Bulletin, Vol 4, No. 2 (American Water Resource Assoc., April 1978), pp 491-493.

A Prototype for Development of Routine Operational Procedures for the Reporting of Self-Monitoring Data as Applied in Wastewater Treatment Facilities and in the Monitoring of Effluent Waste-waters, EPA B-274.876 W.P. EMP 2, 3.77 (National Training and Operational Technology Center, Municipal Operations and Training Division, Office of Water Program Operations, USEPA, 1966).

Seeger, J. M., "A Simple Approach to Improved Wastewater Treatment Reports," Deeds and Data (Water Pollution Control Federation, 1978).

Water and Wastes Engineering (March 1978), p 8.

Webster, R. D., E. D. Smith, and V. Kothandaraman, Pollution Abatement Management System -- Concept Definition, Technical Report N-42/ ADA055565 (U.S. Army Construction Engineering Research Laboratory, May 1978).

APPENDIX A: AN EXAMPLE OF A TYPICAL NPDES PERMIT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1600 PATTERSON, SUITE 1100
DALLAS, TEXAS 75201

Permit No. OK-0002216
Application No. OK-076-0Y1-2-000558

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq; the "Act"),

U.S. Army Field Artillery Center and Fort Sill

is authorized to discharge from a facility located at

Fort Sill, Oklahoma

to an unnamed storm drainage system, thence into Cache Creek, and thence to the Red River.

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective on March 23, 1974.

This permit and the authorization to discharge shall expire at midnight, March 22, 1979.

Signed this 21st day of February 1974.

Arthur W. Busch
Regional Administrator

PART I

Permit No. OK-0002216

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting until June 30, 1977, the permittee is authorized to discharge from outfall 002. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day)		DISCHARGE LIMITATIONS Other Units (Specify)		MONITORING REQUIREMENTS Measurement Frequency	MONITORING REQUIREMENTS Sample Type
	Daily Avg	Daily Max	Daily Avg	Daily Max		
Flow-(MGD)	-	-	-	-	Monthly	-
Total Suspended Solids	1.7 (3.7)	1.7 (3.7)	-	-	Monthly	Grab
Oil & Grease	0.6 (1.2)	0.6 (1.2)	-	-	Monthly	Grab

2. During the period beginning July 1, 1977, and lasting until the expiration date of this permit, the permittee is authorized to discharge from outfall 002. The swimming pool filter backwash discharge shall cease and other discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day (lbs/day)		DISCHARGE LIMITATIONS Other Units (Specify)		MONITORING REQUIREMENTS Measurement Frequency	MONITORING REQUIREMENTS Sample Type
	Daily Avg	Daily Max	Daily Avg	Daily Max		
Flow-(MGD)	-	-	-	-	Monthly	-
Total Suspended Solids	1.1 (2.4)	1.1 (2.4)	-	-	Monthly	Grab
Oil & Grease	0.4 (0.8)	0.4 (0.8)	-	-	Monthly	Grab

3. The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored.

4. There shall be no discharge of floating solids or visible foam in other than trace amounts.

5. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: at the discharge point shown on the attached map where the unnamed storm drainage ditch crosses the south boundary of the base.

B. MONITORING AND REPORTING

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Reporting

Monitoring results obtained during the previous three months shall be summarized and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed reporting period. The first report is due on May 15, 1974. Duplicate signed copies of these, and all other reports required herein, shall be submitted to the Regional Administrator and the State at the following addresses:

Environmental Protection Agency
Permits Branch (Phone) 214-749-1983
1600 Patterson, Suite 1142
Dallas, Texas 75201

Oklahoma Water Resources Board
2241 Northwest 40th Street
Oklahoma City, Oklahoma 73112

3. Definitions

a. The "daily average" discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the number of days during the calendar month when the measurements were made.

b. The "daily maximum" discharge means the total discharge by weight during any calendar day.

4. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304(g) of the Act, under which such procedures may be required.

5. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date, and time of sampling;

b. The dates the analyses were performed;

c. The person(s) who performed the analyses;

d. The analytical techniques or methods used; and

e. The results of all required analyses.

6. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form (EPA No. 3320-1). Such increased frequency shall also be indicated.

7. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the State water pollution control agency.

C. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the modified effluent limitations specified for discharges in accordance with the following schedule:

   (a) Report of progress July 1, 1974

   (b) Report of progress January 1, 1975

   (c) Completion of preliminary plans by July 1, 1975

   (d) Approval of funding by January 1, 1976

   (e) Award of contract by July 1, 1976

   (f) Commencement of construction by August 1, 1976

   (g) Completion of construction by June 15, 1977

   (h) Attainment of operational level by June 30, 1977

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

PART II

A. MANAGEMENT REQUIREMENTS

1. Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

2. Noncompliance Notification

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit, the permittee shall provide the Regional Administrator and the State with the following information, in writing, within five (5) days of becoming aware of such condition:

a. A description of the discharge and cause of noncompliance; and

b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

3. Facilities Operation

The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

4. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to navigable waters resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

5. Bypassing

Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where unavoidable to prevent loss of life or severe property damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Regional Administrator and the State in writing of each such diversion or bypass.

6. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed from or resulting from treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

7. Power Failures

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

a. In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities;

or, if no date for implementation appears in Part I,

b. Halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of one or more of the primary sources of power to the wastewater control facilities.

B. RESPONSIBILITIES

1. Right of Entry

The permittee shall allow the head of the State water pollution control agency, the Regional Administrator, and/or their authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

2. Transfer of Ownership or Control

In the event of any change in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Regional Administrator and the State water pollution control agency.

3. Availability of Reports

Except for data determined to be confidential under Section 308 of the Act, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act.

4. Permit Modification

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

5. Toxic Pollutants

Notwithstanding Part II, B-4 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified.

6. Civil and Criminal Liability

Except as provided in permit conditions on "Bypassing" (Part II, A-5) and "Power Failures" (Part II, A-7), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond his control, such as accidents, equipment breakdowns, or disputes.

7. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

8. State Laws

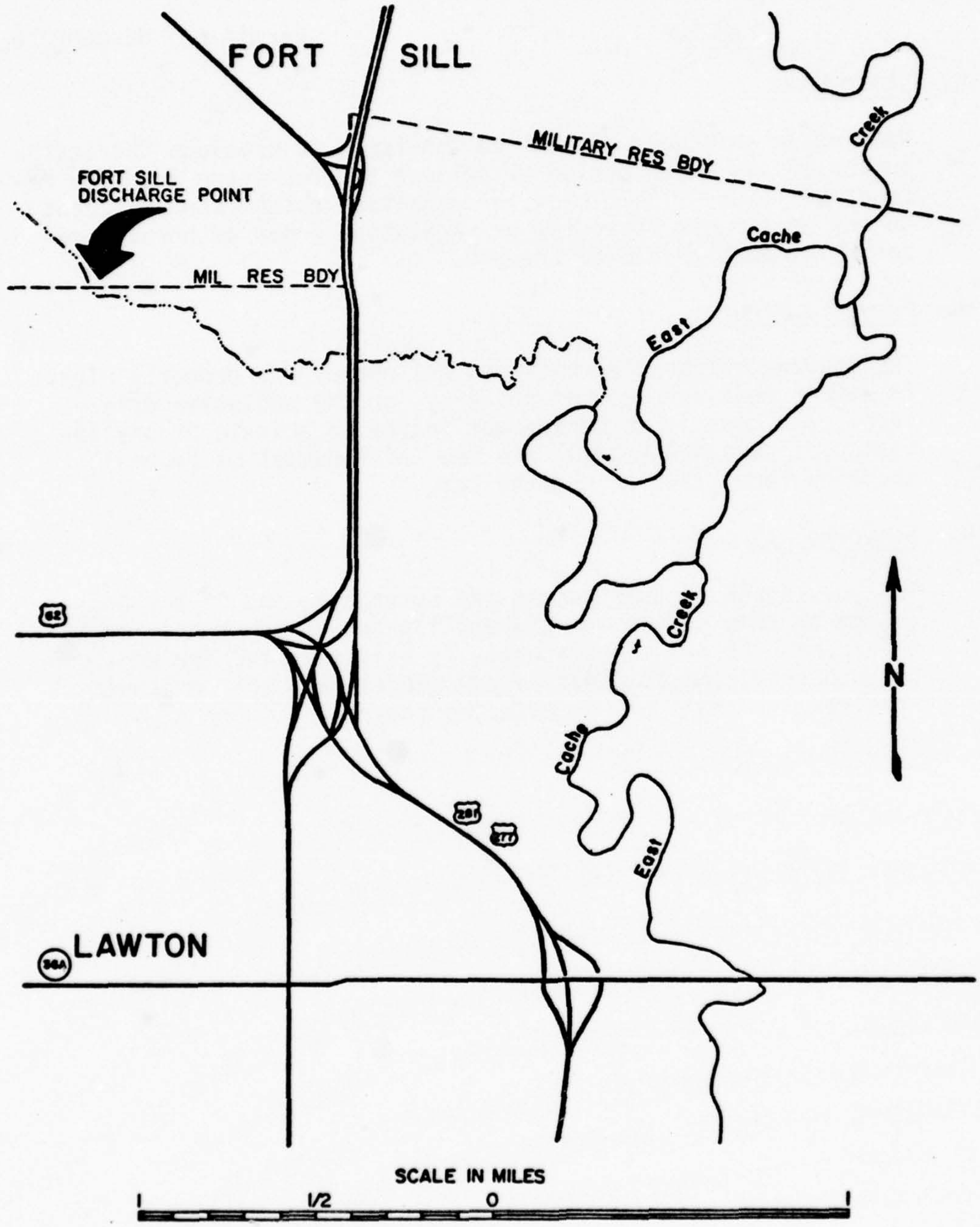
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

9. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the applicant of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.


FORT SILL
MILITARY RES BDY
Creek
FORT SILL
DISCHARGE POINT
MIL RES BDY
Cache
East
62
Creek
N
Cache
281
277
East
36A
LAWTON
SCALE IN MILES
1/2
0
1

APPENDIX B:

EXAMPLES OF SYSTEM OUTPUT

In the following examples, actual PAMS printout appears enclosed in boxes. In some cases, comment has been provided above to the right of the boxes to further explain how each PAMS command is being used.

Within the boxes, the underlined material is supplied by the PAMS user while that which is not underlined is the system response.

Example #1

Entering PAMS is as easy as typing "PAMS".

```
% pams
Welcome to the PAMS information retrieval program
For help, type 'help pams commands'
205 source permits in current list

What next?
```

Example #2

Leaving PAMS is as easy as typing "QUIT".

```
What next?
quit
%
```

Example #3

The "help" commands are available to provide instruction in the use of any or all PAMS commands. Typing "help pams commands" gives a brief description of all commands.

```
What next?
help pams commands
 pams commands:

     See also "find", "show", "list" etc.

     help                    Type "help <term>" to see a message on
                             the given term.
```

find <keyword>	selects a list of all source permits associated with the given keyword.
and <keyword>	narrows down the current list of source permits to those associated with the given keyword.
or <keyword>	augments the current list of keywords to include all source permits associated with the given keyword.
except <keyword>	narrows the current list of source permits to just those that are not associated with the given keyword.
peek <category>	invokes the Unix editor on a copy of the file of keywords belonging to the given keyword category. Type "help keyword categories" to see a list.
show	displays a list of the source permits in the current list.
list	displays a list of keywords associated with the source permits in the current list.
quit	ends the pams session.

Example #4

More information can be obtained about a specific command by asking for help with a PAMS term:

```
What next?

help find
        find:  ( "find <keyword>" )

             See also, "and", "or", "except", "save", "restore"

     The "find" command creates a list of source permits consisting of
all those source permits in the data base which are associated with the
given keyword.  This list of source permits may be further modified by
using the other selection commands, "and", "or", and "except".  If the
user enters an invalid keyword, the program responds with a message
"can't find <keyword>".  The user may want to use the "list" command or
the "peek" command as a source of possible keywords to use with "find".
The purpose of the PAMS retrieval program is to extract from the entire
```

set of NPDES permits only those permits in which there is a present interest. The list of permits in which there is a current interest is called the "current list" in the following examples. The "find", "or", "and", and "except" commands are used to narrow or augment the present set to arrive at the "current list".

Example #5

The "find" command is the primary searching device. It is used with one of a number of searchable keywords, for example:

What next? find clinton usar center 1 found	This finds all permits with facility named "clinton usar center".
What next? find ky0002917 3 found	This finds all permits numbered "ky0002917".
What next find ohio river 5 found	This finds all permits with "ohio river" as watershed.

The "or" command is used to augment the current list with permits meeting an additional criterion.

Example #6

What next? find ohio 27 found	This finds all permits for the state of Ohio.
What next? or kentucky 8 found 35 in current list	Adds to the above list all permits for Kentucky.
What next? or virginia 55 found 90 in current list	Adds to the list all permits for Virginia.

Example #7

```
What next?
find flow
non-compliance?
n
196 found

What next?
or ph
non-compliance?
n
199 found
201 in current list
```

This finds all permits that are monitoring for flow. By replying "y" here, PAMS would find only the permits in non-compliance for flow.

Adds to above list all permits monitoring for pH.

Example #8

```
What next?
find fort gordon
Which category?
1: installation
2: facility
1
1 found

What next?
or fort hamilton
Which catetory?
1: installation
2: facility
1
5 found
6 in current list

What next?
or fort jackson
Which category?
1: installation
2: facility
1
1 found
7 in current list

What next?
list facility installation
caven point usar center ( 3 )
    installation: fort hamilton

fort gordon ( 4 )
    installation:  fort gordon
```

This finds all permits with Fort Gordon as the reporting installation.

Adds to the list all the permits with Fort Hamilton as reporter.

Adds to the list all permits with Fort Jackson as reporter.

This list command prints out the facility names and reporting installation names for all permits in the current list.

```
fort hamilton ( 2 )
    installation:  fort hamilton

fort jackson ( 1 )
    installation:  fort jackson

highland army air defense site ( 1 )
    installation:  fort hamilton

u.s. nike 93/94 ( 1 )
    installation:  fort hamilton

u.s. nike ny 60 housing ( 1 )
    installation:  fort hamilton
```

The "and" command limits the current list of permits to only those associated with the given keyword.

The following example illustrates the use of the "and" command to reduce the current list.

Example #9

```
What next?
find ohio
27 found

What next?
and washrack
28 found
10 in current list

What next?
and big miami river
2 found
2 in current list

What next?
show keys
sp #135  oh0110400  001
troy memorial usar center
fort knox, tradoc
region 5, ohio
    county:
        n county

    city:
        troy
```

This finds all permits for the state of Ohio.

This limits the list to only those Ohio permits that deal with washracks.

This limits the above 10 permits to only those discharging into the Big Miami River.

By showing the keywords for the two resulting permits, it can be seen that they both have "ohio", "washrack", and "big miami river" as keywords.

```
    descriptor:
        washrack

    watershed:
        big miami river

    effluent:
        ss
        oil & grease
        phosphorus
        ph
        flow
******

sp #136  oh0110400  002
troy memorial usar center
fort knox, tradoc
region 5, ohio
    county:
        n county

    city:
        troy

    descriptor:
        washrack

    watershed:
        big miami river

    effluent:
        ss
        oil & grease
        phosphorus
        ph
        flow

******
```

The "except" command also can be used to limit the current list, since it removes from it all permits associated with the given keyword.

Example #10

```
What next?
find region 4
53 found
```

The current list begins with all permits in region 4.

```
What next?
list state
alabama ( 15 )
georgia ( 13 )
kentucky ( 8 )
mississippi ( 10 )
south carolina ( 7 )

What next?
except alabama
15 found
38 in current list

What next?
except georgia
13 found
25 in current list

What next?
list state
kentucky ( 8 )
mississippi ( 10 )
south carolina ( 7 )
```

By listing, it can be found that these five states fall under region 4 jurisdiction.

This eliminates all Alabama permits from this list.

This eliminates all Georgia permits.

Listing now shows that just three states remain.

If the user wants to save the list of permits in the current list for future reference, he/she may do so by using the "save" command.

Example # 11

```
What next?
find sc0029807
1 found

What next?
or ky0002917
3 found
4 in current list

What next?
save MYFILE
```

The current list contains all permits numbered "sc0029807".

together with all those numbered "ky0002917".

The file name is of the user's choosing.

Several searches or several days later, the "restore" command replaces the current list with a list of permits in the stored file.

Example #12

```
What next?
restore MYFILE

What next?
list permit
ky0002917 ( 3 )
sc0029807 ( 1 )
```

The permits from the above current list are restored.

Keyword categories are region, state, county, city, permit, source, descriptor, watershed, facility, installation, command, and effluent. The "find", "and", "or", and "except" commands are used to search a particular keyword value from any of the categories. However, the "list" command is used with any of the category names. It displays the keywords associated with permits in the current list for a specified category or categories.

Example #13

This example shows how the "list" command works on one of the keyword categories -- region. The "find" is used with any of the keywords in that category.

```
What next?
list region
region 2 ( 14 )
region 3 ( 57 )
region 4 ( 53 )
region 5 ( 28 )
region 6 ( 36 )
region 7 ( 17 )
```

```
What next?
find region 5
28 found
```

For state, the category can be listed or a particular state can be searched:

Example #14

```
What next?
list state
alabama ( 15 )
arkansas ( 9 )
georgia ( 13 )
indiana ( 1 )
kansas ( 1 )
kentucky ( 8 )
mississippi ( 10 )
missouri ( 16 )
```

```
What next?
find oklahoma
26 found
```

```
new jersey ( 13 )
new york ( 1 )
ohio ( 27 )
oklahoma ( 26 )
pennsylvania ( 2 )
south carolina ( 7 )
texas ( 1 )
virginia ( 55 )
```

and for county:

Example #15

```
What next?
list county
cleveland ( 3 )
comanche ( 3 )
n county ( 19 )
tulsa ( 1 )
```

```
What next?
find comanche
3 found
```

Example #16

and city:

```
What next?
list city
abbeyville ( 1 )
ada ( 1 )
akron ( 2 )
anniston ( 1 )
antlers ( 1 )
ardmore ( 1 )
bardstown ( 1 )
bellaire ( 2 )
bowling green ( 13 )
brookhaven ( 1 )
bryan ( 2 )
bullville ( 1 )
cadiz ( 2 )
camden ( 1 )
canton ( 2 )
chickasha ( 1 )
clarksdale ( 1 )
clinton ( 1 )
conway ( 1 )
delaware ( 2 )
durant ( 1 )
el dorado ( 1 )
```

```
What next?
find florence
Which category?
1: county
2: city
2
1 found

What next?
find canton
2 found
```

```
fayetteville ( 1 )
florence ( 1 )
fort thomas ( 1 )
freemont ( 2 )
gadsden ( 1 )
greenville ( 1 )
greenwood ( 1 )
hattiesburg ( 1 )
highlands ( 2 )
huntsville ( 1 )
jackson ( 2 )
jersey city ( 3 )
kenton ( 1 )
kings mills ( 2 )
lawton ( 1 )
little rock ( 2 )
louisville ( 2 )
macon ( 1 )
mahwah ( 2 )
mansfield ( 1 )
marion ( 1 )
mcalester ( 1 )
meridian ( 1 )
miami ( 1 )
```

and permit number:

Example #17

```
What next?
find region 2
14 found

What next?
list permit
nj0004855 ( 4 )
nj0021946 ( 2 )
nj0022306 ( 2 )
nj0022322 ( 2 )
nj0023655 ( 3 )
ny0023876 ( 1 )
```

```
What next?
find nj0023655
3 found
```

and source number:

Example #18

What next? list source 001 (1) 002 (1) 003 (1)	What next? and 001 115 found 1 in current list

and source descriptor:

Example #19

What next? find region 3 57 found What next? list descriptor air conditioning tower (14) boat maintenance area (1) boiler (11) drainage area (6) fuel storage (1) gas station run-off (1) maintenance area (10) pol storage area (1) sewage treatment plant (10) storm run-off (1) washracks (14)	What next? find boiler 11 found What next? find boiler 11 found

and watershed:

Example #20

What next? find kentucky 8 found What next? list watershed beech fork tributary (1) mill creek (4) ohio river (3) otter creek (3)	What next? find mill creek 18 found

and major installation and facility:

Example #21

```
What next?
find region 4
53 found

What next?
list installation
fort benning ( 11 )
fort gordon ( 4 )
fort jackson ( 1 )
fort knox ( 5 )
fort mcclellan ( 9 )
fort monroe ( 6 )
fort rucker ( 14 )
n reporter ( 3 )

What next?
and fort mcclellan
which category?
1: installation
2: facility
1
9 found
9 in current list

What next?
list facility
clarksdale usar center ( 1 )
fort mcclellan ( 3 )
usar center ( 5 )

What next?
and usar center
6 found
5 in current list
```

Example #22

and command:

```
What next?
list command
tradoc (   )
forscom (   )
darcom (   )
etc.
```

```
What next?
find tradoc
205 found
```

Example #23

and effluents (PAMS will ask if only those permits which are exceeding limits for specified effluent are desired (response = y) or whether all permits limiting that effluent are desired (response = n).

```
What next?
list effluent
non-compliance?
n
ammonia ( 1 )
bod5 ( 3 )
fecal coliform ( 1 )
flow ( 28 )
oil & grease ( 27 )
ph ( 28 )
phosphorus ( 28 )
residual chlorine ( 1 )
ss ( 28 )
```

```
What next?
find oil & grease
non-compliance?
n
122 found

What next?
find ammonia
non-compliance?
y
0 found

What next?
find bod5
non-compliance?
y
7 found
```

Though the events category may not be listed, a specific event may be used as a searching keyword. PAMS will ask if only those permits having an event in non-compliance are desired (response = y) or if all permits with the specified event (response = n) are desired.

The starting date/ending date prompts allow the user to search for events that occur within a specified time period.

Example #24

```
What next?
find reapply for permit
non-compliance?
n
enter starting date:  78/1/1
enter ending date:  79/1/1
9 found

What next?
find expiration date
non-compliance?
n
enter starting date:  79/1/1
enter ending date:
143 found
```

Finds all permits that require the permittee to reapply for permit between specified dates.

Finds all permits that expire after specified date.

Example #25

```
What next?
find all events
non-compliance?
y
enter starting date:
enter ending date:
1 found

What next?
show events
sp #100 mo0029751  001
fort leonard wood

EVENTS:
```

Finds any event that is in non-compliance at any time.

Prints the event schedule to illustrate the reason for non-compliance.

event	duedate	donedate	
effective date	74/7/5	n/a	
report of progress	75/6/30	75/6/30	
completion of plans	75/12/31	75/12/31	
construction begins	76/6/30	76/6/30	
construction complete	77/3/31	77/3/31	
attainment of operational level	77/6/30	77/6/30	
reapply for permit	79/1/4	-	LATE
expiration date	79/7/4	n/a	

******

Example #26

```
What next?
find expiration date
non-compliance?
n
enter starting date: 79/1/1
enter ending date: 79/2/1
4 found

What next?
show events
sp #94  ok0002259  001
norman usar center

EVENTS:
```

Finds all permits with expiration date falling within specified dates.

Prints event schedules for those permits

event	duedate	donedate
effective date	73/12/26	n/a
report of progress	74/1/1	74/1/1
report of progress	74/4/1	74/4/1

report of progress	74/7/1	74/7/1
report of progress	74/10/1	74/10/1
report of progress	75/1/1	75/1/1
award of contract by	75/3/1	75/3/1
commencement of construction	75/4/1	75/4/1
report of construction progress	75/5/1	75/5/1
attainment of operational level	75/5/1	75/5/1
reapply for permit	79/7/24	79/7/24
expiration date	79/1/24	n/a

******

sp #163 ok0002275 001
perez usar center

EVENTS:

event	duedate	donedate
effective date	74/1/27	n/a
report of progress	74/1/1	74/1/1
report of progress	74/4/1	74/4/1
report of progress	74/7/1	74/7/1
report of progress	74/10/1	74/10/1
report of progress	75/1/1	75/1/1
award of contract	75/3/1	75/3/1
construction begins	75/4/1	75/4/1
report of construction progress	75/5/1	75/5/1
attainment of operational level	75/7/1	75/7/1
reapply for permit	78/7/26	78/7/26
expiration date	79/1/26	n/a

******

sp #164 ok0002283 001
tulsa usar center

EVENTS:

event	duedate	donedate
effective date	74/1/25	n/a
report of progress	74/1/1	74/1/1
report of progress	74/4/1	74/4/1
report of progress	74/7/1	74/7/1
report of progress	74/10/1	74/10/1
report of progress	75/1/1	75/1/1
report of progress	75/4/1	75/4/1
report of progress	75/7/1	75/7/1
report of progress	75/10/1	75/10/1
report of progress	76/1/1	76/1/1
award of contract	76/3/1	76/3/1
construction begins	76/4/1	76/4/1
report of construction progress	76/5/1	76/5/1

```
attainment of operational level        76/7/1          76/7/1
reapply for permit                     78/7/24         78/7/24
expiration date                        79/1/24         n/a
******

sp #182  ar0003000  001
fayetteville usar center

EVENTS:

event                                  duedate         donedate
effective date                         74/1/25         n/a
report of progress                     74/1/1          74/1/1
report of progress                     74/4/1          74/4/1
report of progress                     74/7/1          74/7/1
report of progress                     74/10/1         74/10/1
report of progress                     75/1/1          75/1/1
award of contract                      75/3/1          75/3/1
construction to begin                  75/4/1          75/4/1
report of construction progress        75/5/1          75/5/1
attainment of operational level        75/7/1          75/7/1
reapply for permit                     78/7/24         78/7/24
expiration date                        79/1/24         n/a
******
```

A number of searchable keywords (called "flags") do not fall into any of the previous categories. They are "all", "event exceptions", "late events", "effluent exceptions", "no reports", "late reports", "missing data", or "non-compliance".

Example #27

The following example shows how some of these are used.

```
What next?
find late events
1 found

What next?
or no reports
205 found
205 in current list

What next?
or late reports
0 found
205 in current list
```

Finds all permits where one or more events are late.

Adds to the list all permits for which no reports were submitted.

Adds to the list all permits for which reports are late.

```
What next?
or missing data
0 found
205 in current list

What next?
or non-compliance
0 found
205 in current list

What next?
and fort sill
Which category?
1: installation
2: facility
1
19 found
19 in current list
```

Adds to the list all permits for which missing data are noted.

Adds to the list all permits for which measurements noted in non-compliance.

Limits the above list to only those permits for which Fort Sill is the reporting installation.

The "list" command also provides a useful tool for reviewing keywords associated with the permits in the current list. "List, then find" has been demonstrated in previous examples to help users choose keywords; "find, then list" also serves a useful purpose.

Example #28

```
What next?
find region 3
57 found

What next?
list facility installation
camp a.p. hill ( 1 )
    installation: camp a.p. hill

carlisle barracks ( 2 )
    installation: carlisle barracks

fort a.p. hill ( 12 )
    installation: fort a.p. hill

fort belvoir ( 37 )
    installation: fort belvoir

fort eustis ( 1 )
    installation: fort eustis

fort lee ( 1 )
    installation: fort lee
```

This finds all permits in region 3,

and lists the facility and installation for each.

```
fort monroe ( 1 )
    installation: fort monroe

usag-camp pickett ( 2 )
    installation: usag-camp pickett
```

Example #29

```
What next?
find swimming pool
11 found


What next?
list effluent
non-compliance?
n
flow ( 9 )
oil & grease ( 5 )
ph ( 10 )
residual chlorine ( 1 )
ss ( 10 )
temperature ( 2 )
```

This finds all the permits for which swimming pool is the source,

and lists which effluents are being monitored for them.

Example #30

```
What next?
find ohio river
5 found


What next?
list permit
ky0042684 ( 1 )
ky0042692 ( 1 )
ky0042706 ( 1 )
oh0110281 ( 2 )
```

This finds all permits for which there is a discharge into the ohio river,

and lists the permit numbers.

Once the permits of interest have been selected, it is usually desirable to display all or part of the data associated with the permits. The "show" command can be used with one or more of the following options: keywords, limits, events, notes, and reports.

Example #31

```
What next?
find #57
sp 57 selected
```

This is a PAMS numbering system for each of the NPDES permits in the file.

```
What next?
show
sp #57  ky0002917  003
fort knox
******

What next?
show keys
sp #57  ky0002917  003
fort knox
fort knox, tradoc
region 4, kentucky
    county:
        n county

    city:
        n city


    descriptor:
        water treatment plant

    watershed:
        otter creek
        mill creek

    effluent:
        flow
        ss
        ph
******

What next?
show limits notes
sp #57  ky0002917  003
fort knox

EFFLUENT LIMITATIONS:

effluent 'flow'

min    avg    max    units  min    avg    max    units  freq   type
*      -      -      mgd    *      *      *      *      1/wk   n/a

effluent 'ss'

min    avg    max    units  min    avg    max    units  freq   type
*      -      -      lb/day -      30     50     mg/l   1/wk   eq v c
```

The "show" command without options specified displays the basic identifying keywords.

This displays all descriptive keywords.

To date, data have not been added to PAMS regarding which county NPDES permit ky0002917-003 is in.

These are the effluent parameters regulated by the NPDES permit.

This displays the effluent limitations and also the note sections.

effluent 'ph'

min	avg	max	units	min	avg	max	units	freq	type
*	*	*	*	6.0	-	9.0	stunit	1/wk	-

NOTES:
samples taken for monitoring purposes shall be taken at a point after final treatment which is representative of the total discharge prior to mixing with the receiving water or surface runoff.
there shall be no visible foam or floating solids other than in trace amounts.
******

What next?
show events — This displays the event schedule.
sp #57 ky0002917 003
fort knox

EVENTS:

event	duedate	donedate
effective date	75/02/13	n/a
submit listing of existing sources	75/06/30	75/06/30
submit preliminary engineering report	75/09/30	75/09/30
submit final engineering report	75/12/31	75/12/31
complete final plans & specifications	76/06/30	76/06/30
attain final effluent limitations	77/07/1	77/07/1
reapply for permit	79/08/12	79/08/12
expiration date	80/02/12	n/a

******

What next?
show reports — This displays the current self-monitoring report data (In this case, none is entered yet.)
sp #57 ky0002917 003
fort knox

REPORTS:
******

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Concept definition for the Problems Data Base Component of the Water Pollution Abatement Subsystem of the Pollution Abatement Management System (PAMS) / by E. D. Smith, R. D. Webster. -- Champaign, IL : Construction Engineering Research Laboratory ; Springfield, VA : available from NTIS, 1979.
54 p. ; 27 cm. (Interim report ; N-73)

1. Water-pollution. 2. Environmental monitoring. I. Webster, Ronald Dwight. II. Title. III. Series: U.S. Army Construction Engineering Research Laboratory. Interim report ; N-73.